Publication status: This preprint has not been published elsewhere.

Araceae in the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil

Vanda Marie Higashi, Leandro Matheus de Carvalho Vaz, Juliana Moreira Bianchi, Paulo Affonso

https://doi.org/10.1590/2236-8906e052025

Submitted on: 2026-04-08
Posted on: 2026-04-14 (version 1)
(YYYY-MM-DD)

Hoehnea 53: e052025, 2026 https://doi.org/10.1590/2236-8906e052025

Araceae Juss. in the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil

Vanda Marie Higashi[1] (https://orcid.org/0009-0009-7715-4351),
Leandro Matheus de Carvalho Vaz[2] (https://orcid.org/0000-0002-9179-3610),
Juliana Moreira Bianchi[2] (https://orcid.org/0000-0002-4439-1344) and
Paulo Affonso[3,4] (https://orcid.org/0000-0003-3699-7095)

How to cite: Higashi, V. M., Vaz, L. M. C., Bianchi, J. M. & Affonso, P. 2026. Araceae Juss. in the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil. Hoehnea 53: e052025, 2026. https://doi.org/10.1590/2236-8906e052025.

ABSTRACT – (Araceae in the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil). This paper presents a taxonomic survey of Araceae in the Núcleo Curucutu. For distinction of the species, we elaborated an identification key, morphological descriptions, illustrations, alongside geographical distribution, and phenological data. The family is represented in the area by twelve species: *Anthurium acutum* N.E.Br., *A. comtum* Schott, *A. loefgrenii* Engl., *A. longicuspidatum* Engl., *A. marense* K.Krause, *A. pentaphyllum* (Aubl.) G.Don, *A. sellowianum* Kunth, *Monstera adansonii* Schott, *Philodendron appendiculatum* Nadruz & Mayo, *P. glaziovii* Hook.f., *P. propinquum* Schott., and *P. roseopetiolatum* Nadruz & Mayo. Ten of these species are endemic to Brazil, with nine classified under some category of extinction risk.
Keywords: *Anthurium*, *Monstera*, *Philodendron*

RESUMO – (Araceae no Núcleo Curucutu, Parque Estadual Serra do Mar, Estado de São Paulo, Brasil). Este trabalho consiste no levantamento taxonômico de Araceae no Núcleo Curucutu. Para a distinção das espécies, nós fornecemos uma chave de identificação, descrições morfológicas, ilustrações, bem como dados de distribuição geográfica e fenológicos. A família está representada na área por doze espécies: *Anthurium acutum* N.E.Br., *A. comtum* Schott, *A. loefgrenii* Engl., *A. longicuspidatum* Engl., *A. marense* K.Krause, *A. pentaphyllum* (Aubl.) G.Don, *A. sellowianum* Kunth, *Monstera adansonii* Schott, *Philodendron appendiculatum* Nadruz & Mayo, *P. glaziovii* Hook.f., *P. propinquum* Schott. e *P. roseopetiolatum* Nadruz & Mayo. Dez dessas espécies são endêmicas do Brasil, das quais nove estão classificadas em alguma categoria de risco de extinção.
Palavras-chave: *Anthurium*, *Monstera*, *Philodendron*

Introduction

Araceae Juss. is the most diverse family within Alismatales, both in terms of species richness and morphological, as well as ecological variation. Its 144 genera and 3645 species are predominantly tropical, occurring on every continent, except Antarctica (Boyce & Croat 2018). The family comprises terrestrial plants or rarely aquatic, epiphyte to hemi-epiphyte, living on tree trunks, in rock crevices, or on them, in various types of soils. They are recognized for having small flowers grouped on a spadix, terminal or pseudolateral, with flowers being either monoclinous or diclinous, attached to a spathe (Sakuragui 1994, Temponi *et al.* 2005).

Economically, some species of Araceae are significant in nutrition, known as Unconventional Food Plants. *Monstera deliciosa* Liebm. (split-leaf philodendron) stands out for having a sweet fruit consumed fresh; the sautéed or blanched leaves of *Xanthosoma sagittifolium* (L.) Schott (tannia) are appreciated in certain communities (Oliveira *et al.* 2022). The family comprises numerous species that can cause intoxication in humans, either through dermal contact or ingestion of needle-shaped crystals of calcium oxalate called raphides, present in all parts of the plants. Notable species in this regard include *Dieffenbachia seguine* (Jacq.) Schott (dumb cane) and *Zantedeschia aethiopica* (L.) Spreng. (calla lily), which are also widely used in ornamentation (Baltar *et al.* 2017).

1. Universidade Santo Amaro, Ciências Biológicas, Rua Professor Enéas de Siqueira Neto, 340, 04829-300 São Paulo, SP, Brazil
2. Instituto de Pesquisas Ambientais, Herbário SP, Avenida Miguel Stéfano, 3687, 04301-012 São Paulo, SP, Brazil
3. Centro Universitário FAM, Ciências Biológicas, Rua Augusta, 1.508, 01304-001 São Paulo, SP, Brazil
4. Corresponding author: pauloaffonso.botanico@gmail.com

In Brazil, 53 genera of Araceae are recognized, with 39 native and six endemic, totaling 575 species, of which 516 are native and 288 endemic. In São Paulo State, 31 genera are recorded, 20 of them native, comprising 111 species, 83 of which are native (Araceae *in* Flora e Funga do Brasil 2025). However, few floristic studies have focused on the family within São Paulo State. The first were carried out by Engler (1878), with the description of *Anthurium regnellianum* Engl., and later by Coelho (2000), who recorded five genera and 10 species in the Parque Estadual Fontes do Ipiranga, in the city of São Paulo. Other studies in São Paulo State also contributed to the recognition of endemic species, such as that of Catharino & Coelho (2010), who reported *Anthurium tomasiae* Cath. & Nadruz. The most comprehensive study was carried out by Coelho (2012) as part of the Flora Fanerogâmica do Estado de São Paulo project, who documented 13 genera and 77 species. The most recent survey to date was conducted on Ilha do Cardoso, located on the southern coast of the State, where three genera and 14 species were identified (Coelho 2015).

The present study is a part of the Flora of Núcleo Curucutu project, conducted through a collaboration between Universidade Santo Amaro (UNISA) and the Herbário Municipal de São Paulo (PMSP). Research in the study area began with Garcia & Pirani (2005), who performed a floristic inventory of terrestrial plants in the area, cataloging six species of Araceae. Since then, studies on the species in this area have been deepened through floristic surveys conducted by undergraduate students in collaboration with the authors of this work (JMB, LMCV, and PA). To date, 15 studies have been carried out. Within the order Alismatales, this family is the sole representative in the study area. Additional research includes some monocots, such as Iridaceae (Takeuchi *et al.* 2008), *Oncidium* Sw. - Orchidaceae (Rosa & Affonso 2009), and Zingiberales (Vaz & Affonso 2022).

To progress the taxonomic investigation of Araceae in the Núcleo Curucutu, we carried out floristic survey, including, illustrations, descriptions, an identification key, and data on geographic distribution of each species.

Material and methods

The Núcleo Curucutu is situated in the Parque Estadual Serra do Mar, São Paulo State, Brazil, which was originally a coal-producing farm. In 1958, it was acquired by the São Paulo State through decree no. 36.544/60, transforming its 37,512 hectares into a Forest Reserve, that spanning the municipalities of Itanhaém, Juquitiba, Mongaguá, and São Paulo (Figure 1) (Guia de Áreas Protegidas 2023).

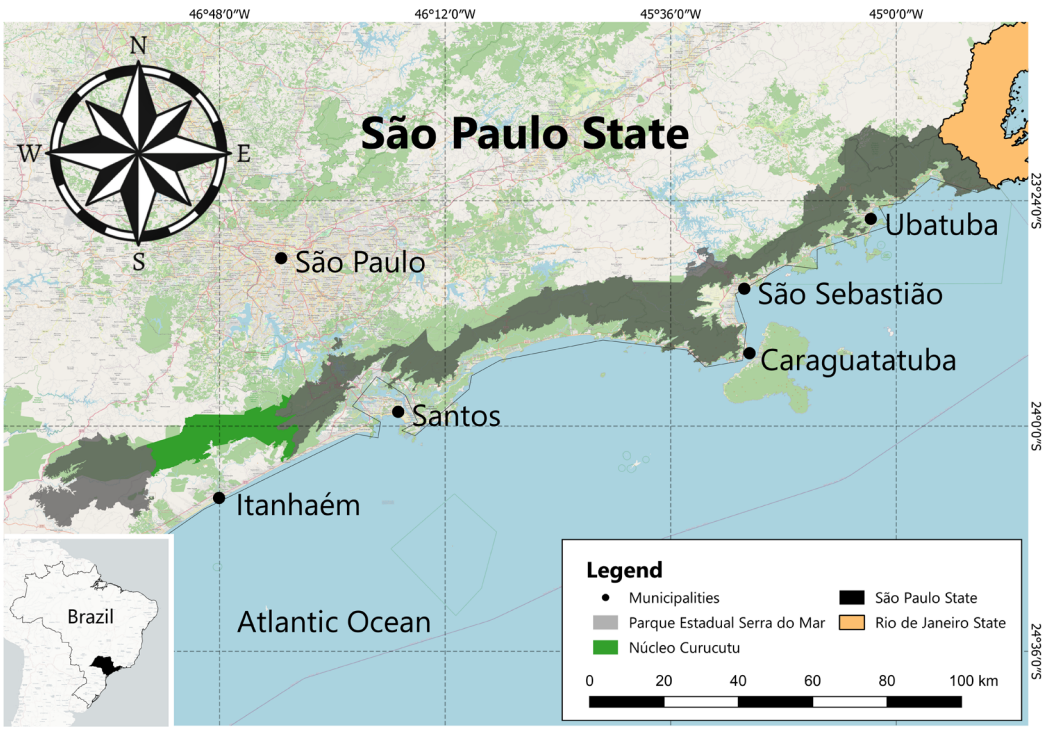

Figure 1. Location and delimitation of the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil.

The region comprises cloud forest and grassland vegetation of the Atlantic Forest domain. It receives annual precipitations of 2000-3000 mm/year and experiences a temperate rainy climate characterized by hot and rainy summers, as well as milder winters. The vegetation on some slopes protect them from the winds and is rich in bromeliads, orchids, ferns, and others (Bellato & Mendes 2002).

This study utilized specimens from the Núcleo Curucutu that had been previously collected and identified, as well as additional specimens gathered during monthly field visits to the study area between March 2002 and March 2003, and from sporadic collections conducted between 2004 and 2009. Collection, preservation, and herborization of the botanical material followed Fidalgo & Bononi (1989). After collection, the material was identified and deposited in the herbaria collections of PMSP and UNISA herbaria.

For identifications and descriptions, specialized literature was consulted (Mayo *et al.* 1998, Temponi 2006, Sakuragui *et al.* 2007, Coelho 2012, among others). Araceae collections from PMSP, SP, SPF, SPSF, and UNISA were consulted, in addition to the virtual collection of the following herbaria: CESJ, ESA, HRCB, HUEM, MO, NY, RB, UB, and UEC (acronyms according to Thiers, continuously updated). Morphological terms from Harris & Harris (1994), Beentje (2010), and Gonçalves & Lorenzi (2011) were utilized. The distribution map was created using QGIS version 3.38.3 (QGIS Development Team 2024). Flowering and fruiting data were extracted from the labels in the exsiccates.

Results and Discussion

For the Núcleo Curucutu, twelve species of Araceae were recorded: *Anthurium acutum* N.E.Br., *A. comtum* Schott, *A. loefgrenii* Engl., *A. longicuspidatum* Engl., *A. marense* K.Krause, *A. pentaphyllum* (Aubl.) G.Don, *A. sellowianum* Kunth, *Monstera adansonii* Schott, *Philodendron appendiculatum* Nadruz & Mayo, *P. glaziovii* Hook.f., *P. propinquum* Schott., and *P. roseopetiolatum* Nadruz & Mayo.

Most species presented some degree of threat according to their general distribution or in specific study areas, however, none of the species in this study were classified as threatened in the São Paulo State, according to the latest list of threatened species of the State of São Paulo (Secretaria do Meio Ambiente 2016).

In Coelho (2012), the only specimens from Núcleo Curucutu that were examined belong to *Anthurium comtum* (*Romão et al. 648*), *A. longicuspidatum* (*Farah et al. 2007, 2123, Romão et al. 587, Meireles et al. 117, 143, Souza 142*), *Philodendron propinquum* (*Ferreira et al. 31*), and *P. roseopetiolatum* (*Souza et al. 105, Affonso 29, Garcia 947*). Thus, the present study provides new data and further complements this important contribution to the knowledge of Araceae in the São Paulo State.

Identification key for Araceae of Núcleo Curucutu

1. Leaf blade fenestrate ..... *Monstera adansonii*
1. Leaf blade not fenestrate
   2. Leaves with reticulate venation; bisexual flowers with perigon
      3. Leaf palmate ..... *Anthurium pentaphyllum*
      3. Leaf simple
         4. Leaf blade >30 cm long
            5. Leaf blade sagittate ..... *Anthurium acutum*
            5. Leaf blade oblong, elliptical or lanceolate
               6. Leaf blade oblong to elliptical 38-43 x 4-8 cm, secondary veins slightly prominent abaxially; spathe deciduous ..... *Anthurium comtum*
               6. Leaf blade lanceolate 40.5-57.5 x 6.9-13.5 cm, secondary veins slightly impressed adaxially; spathe persistent ..... *Anthurium sellowianum*
         4. Leaf blade <23 cm long
               7. Petiole cylindrical; spathe linear-lanceolate, green-reddish to vinaceous .... *Anthurium longicuspidatum*
               7. Petiole flattened; spathe slightly naviculate, vinaceous

8. Stem decumbent; leaf blade absent of glandular punctations.....*Anthurium loefgrenii*
8. Stem erect; leaf blade with glandular punctations in both surfaces .....*Anthurium marense*

2. Leaves with pinnate-parallel venation; unisexual flowers without perigon

9. Leaf blade sagittate

10. Petiole and peduncle reddish-vinaceous at the apex; spathe with subtle constriction in the midsection, internally with a vinaceous basal spot..... *Philodendron roseopetiolatum*
10. Petiole and peduncle greenish at the apex; spathe with pronounced constriction in the midsection, internally cream.....*Philodendron appendiculatum*

9. Leaf blade with another shape

11. Leaf blade lanceolate 28.2-33 x 4-7.5 cm; closed sheath; spathe internally green-yellowish and vinaceous .....*Philodendron glaziovii*
11. Leaf blade oblong-lanceolate 7.3-21.2 x 3.2-8.7 cm; presence of open and expanded sheath; spathe internally cream .....*Philodendron propinquum*

Anthurium Schott

Herbs terrestrial or epiphyte; stem erect or scandent; cataphylls and prophylls persistent, entire or decomposing into fibers. Leaves petiolate; geniculum present; blade simple or compound, chartaceous, lanceolate, elliptic, sagittate, or digitate; secondary and tertiary venation reticulate. Inflorescence solitary; peduncle usually elongated; spathe persistent; spadix sessile to stipitate, short to elongated. Bisexual flowers with 4 tepals; stamens 4, with a possible slight difference in size between tepals and stamens, 2 pairs larger, 2 pairs smaller; ovary 2-locular, ovules per locule 1-2, stigma little developed. Fruit berry, spherical.

Anthurium is a neotropical genus comprising approximately 950 species, which are predominantly found in Costa Rica, Panama, Colombia, and Ecuador (Pontes 2014). In Brazil, there are 153 species, with 123 being endemic. In São Paulo State, 34 species are present, 11 being endemic (Coelho *et al.* 2024).

Anthurium acutum N.E. Br., Gard. Chron., ser. 3 2: 776. 1887.
Figures 2 a, 4 a-b

Terrestrial; stem erect; cataphylls and prophylls entire, greenish; internodes 0.6-1 cm long. Petiole 33-67 cm long, cylindrical; geniculum 0.6-1.2 cm long; blade 30-39 × 7.5-12.1 cm, slightly chartaceous, sagittate, absent of glandular punctations, base hastate, apex acute; basal vein 1 on each side; midrib prominent on both surfaces; secondary veins visible abaxially, inconspicuous adaxially; collective veins 0.5-1.1 cm, away from the margin. Peduncle 32.2-58.5 cm long, cylindrical, reddish; spathe 3-8 × 0.8-1.2 cm, persistent, narrow-lanceolate, green; spadix 4-15 cm long, cylindrical, green to brownish, sessile; stipe 1-2 mm long. Immature fruit green.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Sub-bosque de *Pinus*, fl., 14-IV-2001, *F.M. Souza 154* (ESA, UEC); Trilha do Campo, fl., 04-XI-2001, *F.T. Farah et al. 2099* (ESA); Trilha do Banquinho, fl., 27-III-2002, *P. Affonso 577* (UNISA); Trilha do Mirante, fl., 8-VII-1997, *R.J.F. Garcia 1208* (UNISA); fl., 4-VI-1998, *R.J.F. Garcia 1503* (UNISA); fl., 17-III-2000, *R. Simão-Bianchini et al. 1224* (PMSP, SP); fl., 14-IV-2001, *J.P. Souza et al. 3556* (ESA, UEC); fl., fr., 16-IV-2007, *P. Affonso 976* (UNISA); Trilha do Rio Branco, fl., 12-IV-2001, *G.O. Romão et al. 607* (ESA, UEC); Trilha do Rio Embu-Guaçu, fl., 8-VII-1997, *P. Affonso 45* (UNISA); fl., 22-VIII-1997, *P. Affonso 102* (UNISA); fl., 15-XI-2000, *J.V. Coffani-Nunes 161* (PMSP).

Additional examined material: Brazil. São Paulo: Cotia, Reserva Florestal do Morro Grande, fl., 1-IX-1998, *M. Loz et al. 2303* (SP); Cubatão, Serra do Moji, fl., 3-XII-1988, *M. Kirizawa & E.A. Lopes 2123* (MO, SP); São Miguel Arcanjo, Parque Estadual Carlos Botelho, Capão Bonito, fl., 23-IX-1992, *M. Kirizawa & M. Sugiyama 2714* (SP); São Paulo, Cabeceiras do Rio Cotia, fl., 12-VII-1933, *F.C. Hoehne s.n.* (NY 777515, SP 30816); Tapiraí, Sítio Palmeira, fl., 4-I-1997, *R. Mello-Silva 1257* (SP, SPF).

Anthurium acutum is exclusively found in Brazil, inhabiting the Atlantic Forest domain in the States of Paraná, Santa Catarina, and São Paulo (Coelho *et al.* 2024). It was classified as Least Concern (Rocha *et al.* 2014) and is the only species of *Anthurium* found in the Núcleo Curucutu with a sagittate leaf blade.

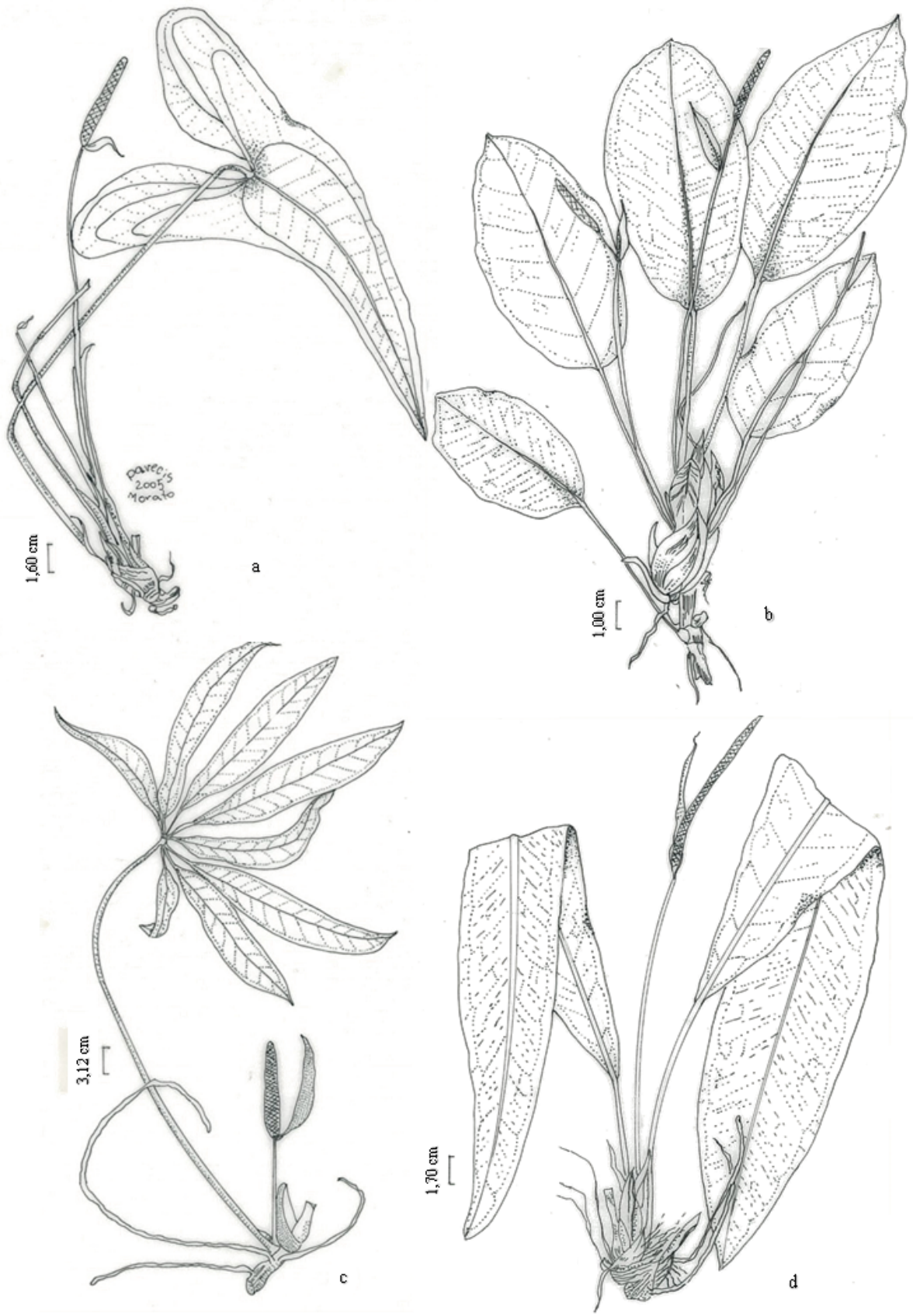

Figure 2. a. *Anthurium acutum* N.E.Br. Habit. b. *Anthurium longicuspidatum* Engl. Habit. c. *Anthurium pentaphyllum* (Aubl.) G.Don. Habit. d. *Anthurium sellowianum* Kunth. Habit.

Figure 4. a-b. *Anthurium acutum* N.E.Br. a. Leaves. b. Inflorescence. c. *Anthurium longicuspidatum* Engl. c. Leaves. d-e. *A. pentaphyllum* (Aubl.) G.Don. d. Adaxial side of the leaves. e. Abaxial side of the leaves. f-j. *A. sellowianum* Kunth. f. Habit. g. Leaves. h. Inflorescence with green spathe. i. Inflorescence with reddish-vinaceous spathe. j. Detail of the spadix. Photos: Paulo Affonso: a-d; Ulisses Gonçalves: e-i; Nicolás Lavandero: j.

Coelho *et al.* (2009) indicate flowering throughout the year and fruiting in the months of March and April. At the Núcleo Curucutu, it was recorded with flowers in March, April, June, July, August, and fruits in April.

In the studies by Almeida *et al.* (2005) and Temponi *et al.* (2012), conducted in protected areas of Minas Gerais State, the species is considered rare, occurring in the interior of humid forest environments, the same condition in which the only specimen from Núcleo Curucutu was found.

Unlike the specimens studied by Coelho (2012), the materials from Curucutu exhibit longer petioles (33-67 cm long vs. 21-64.1 cm long), smaller blades (30-39 cm long vs. 13.7-45.4 cm long), broader green spathes (0.8-1.2 cm long) vs. narrower green to vinaceous spathes (0.4-0.8 cm long), and shorter stipes (1-2 mm long vs. 2-5 mm long).

Among the species native to São Paulo State, *Anthurium acutum* resembles *A. victorii* Nadruz & Cath. due to the presence of 5-11 secondary veins, cylindrical petioles and peduncles, and their terrestrial habit. However, they can be distinguished as *A. acutum* has a blade with a single basal vein for each posterior lobe, whereas *A. victorii* has a blade with two basal veins for each posterior lobe (Coelho *et al.* 2009).

Anthurium comtum Schott, Bonplandia, 10: 87. 1862.

Epiphyte; stem erect; cataphylls and prophylls decomposing into fibers, greenish, pinkish to cream; internodes 0.3 cm long. Petiole 2.5-5 cm long, flattened, caniculate; geniculum ca. 0.7 cm long; blade 38-43 × 4-8 cm, chartaceous, oblong to elliptical, absent of glandular punctations, base obtuse, apex acute; midrib prominent on both surfaces; secondary veins visible adaxially, slightly prominent abaxially; collective veins 0.3-0.5 cm, away from the margin. Peduncle 17-27.5 cm long, cylindrical, greenish; spathe 4.5-9 × 0.6-0.8 cm, deciduous, lanceolate, green; spadix 7-16 cm long, cylindrical, green to brownish, sessile; stipe 1-5 mm long. Immature fruit green, when mature bicolor (base pale yellow, apex greenish).

Examined material: Brazil. São Paulo: Itanhaém, Parque Estadual Serra do Mar, Núcleo Curucutu, Floresta Ombrófila Densa Baixomontana no entorno do Vale do Rio Mambu, 16-IV-2001, fl., *G.O. Romão et al. 648* (ESA, RB).

Additional examined material: Brazil. São Paulo: Eldorado, 4-IX-1995, fl., *V.C. Souza et al. 9146* (ESA). Minas Gerais: Lima Duarte, Parque Estadual de Ibitipoca, 18-I-2005, fl., fr., *L.G. Temponi et al. 400* (RB, SPF).

Anthurium acutum is endemic to the Atlantic Forest domain, found in shaded wet montane and high montane forests with transitions to highland grasslands, reaching up to 1,200 m in altitude. It has a wide distribution along the Brazilian coast, from the southern Bahia forests, through the States of Espírito Santo, Paraná, Rio de Janeiro, and São Paulo, extending inland only in the Minas Gerais State (Coelho *et al.* 2009, 2012, 2024). Species classified as Least Concern (Rocha *et al.* 2014).

The species exhibits lax phenology across different study areas but may flower and fruit throughout the entire year (Coelho *et al.* 2009, Rocha *et al.* 2014, Dutra Junior *et al.* 2024). In the São Paulo State, the species was collected with flowers in January, April, June, and from August to December, and with fruits in February (Coelho 2012). In the study area, it was collected with flowers in April.

Anthurium comtum is distinguished from other species in the study area by having a caniculate petiole and a deciduous spathe. In the São Paulo State, it can be confused with *A. urvilleanum* Schott due to its evident secondary venation and sessile to rarely stipitate spadix. However, they can be distinguished by their habit and fruit color. While *A. comtum* is an epiphyte with berries that are completely bicolored, displaying a pale-yellow base and a greenish apex, *A. urvilleanum* is terrestrial with berries that are wine-colored or at least wine-colored at the apex (Rocha *et al.* 2014, Coelho *et al.* 2024). It is very similar to *A. intermedium* Kunth, which also occurs in São Paulo State, but can be distinguished by its berries, which are reddish-violet at the apex and transition to greenish or translucent toward the base, or, rarely, entirely reddish-violet, whereas the latter species has uniformly green berries (Coelho *et al.* 2009).

Anthurium loefgrenii Engl., Pflanzenr. IV, 23B: 165. 1905.

Epiphyte; stem decumbent; cataphylls and prophylls entire in the apex, sligthly decomposing in the base, internodes 1-1.2 cm long. Petiole 4-15 cm long, flattened; geniculum 0.5-1 cm long; blade 18.6-23 × 5.4-7.4 cm, chartaceous, elliptical, lanceolate to obovate, absent of glandular punctations, base obtuse to acute, apex acute to obtuse-apiculate; mibrid prominent in both surfaces; secondary veins prominent abaxially, slightly visible abaxially; collective veins 0.3-0.8 cm, away from the margin. Peduncle 11.7-30 cm long, angular, vinaceous; spathe 1.2-5 × 0.2-0.7 cm, persistent, slightly naviculate, vinaceous; spadix 2.8 cm long, cylindrical, vinaceous; stipe 1.1-3.5 cm long. Fruit not observed.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Trilha do Rio Branco, 12-IV-2001, fl., *L.D. Meireles 111* (HUEM).

Additional examined material: Brazil. São Paulo: Cananéia, Ilha do Cardoso, 16-VIII-1982, fl., *S.L. Jung-Mendaçolli & A.C. Maruffa 491* (SP); Iguape, 25-VII-1907, fl., *P.A. Usteri s.n.* (SP 10738); Itanhaém, Estrada entre o bairro de Suarão e Fazenda São Luiz, 13-IV-1996, fl., fr., *V.C. Souza et al. 11129* (SP).

Anthurium loefgrenii grows in a humid and shaded environment in sandy soil forests, with rare exceptions in montane slope forests, reaching altitudes between 900 and 1200 m. This species is found in the Atlantic Forest domain in the States of Paraná, Santa Catarina, and São Paulo (Coelho *et al.* 2009, 2012, 2024) and is classified as Least Concern (Rocha *et al.* 2014).

According to Coelho (2012), in the São Paulo State, *Anthurium loefgrenii* was collected with flowers in January, and April to November, and with fruits in September and November. Specifically, in the Ilha do Cardoso, São Paulo State, flowering was observed in June and September (Coelho 2015). In the Paraná State, it flowers and produces fruit year-round (Rocha *et al.* 2014). In the Núcleo Curucutu, it was collected with flowers in April.

The specimens from Curucutu exhibit significant differences compared to those analyzed by Coelho (2012). In our samples, the species was characterized as epiphytic, whereas in the previous study it was described as terrestrial, saxicolous, or rarely hemiepiphytic. Additionally, the spathes are smaller and slenderer with 1.2-5 × 0.2-0.7 cm (vs. 2.1-7.8 × 0.3-0.9 cm).

The species is distinguished from the others in the study area by being the only one with a decumbent stem. It is morphologically similar to *A. longicuspidatum* and *A. sellowianum* in terms of leaf shape. Among these species, which have elliptic to lanceolate leaves, it is the one that exhibits the longest internodes (Rocha *et al.* 2014). It is also very similar to *A. parasiticum* (Vell.) Stellfeld, which also occurs in São Paulo State, but the two can be distinguished by the latter's erect stem, the base of the blade being generally truncate to obtuse and the size larger of the blade (12.9-63.2 × 3-25.7 cm), peduncle (9-47.5 cm), and spathe (2.8-10.9 × 0.45-1.5 cm) (Coelho *et al.* 2009).

Anthurium longicuspidatum Engl., Bot. Jahrb. Syst. 25(3): 415. 1898.
Figures 2 b, 4c

Terrestrial or hemi-epiphyte; stem erect; cataphylls and prophylls entire or decomposing into fibers, pinkish; internodes 0.5-0.9 cm long. Petiole 5.8-11.5 cm long, cylindrical, slightly sulcate on the upper surface; geniculum 0.4-0.7 cm long; blade 7.4-21 × 3.0-7.3 cm, chartaceous, lanceolate to elliptical, absent of glandular punctations, base obtuse, rare acute, apex acute to acuminate; midrib prominent on both surfaces; secondary veins impressed to slightly impressed on both surfaces; collective veins 0.3-0.8 cm, away from the margin. Peduncle 11.5-22.5 cm long, cylindrical, rarely angular, reddish; spathe 2-3.5 × 0.3-0.6 cm, persistent, linear-lanceolate, green-reddish to vinaceous, brownish; spadix 2-5 cm long, cylindrical, brownish to reddish, stipe 2-3.5 mm long. Fruit not observed.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Trilha da Estrada da Entrada, fl., 14-V-1998, *L.C.Q.M.P. Sampaio 74* (UNISA); Trilha do Banquinho, fl., 25-II-1999, *C.M. Izumizawa 154* (UNISA); Trilha do Campo, fl., 25-II-1999, *R.J.F. Garcia 1922* (PMSP); Trilha Nova do Mirante, fl., 21-XII-2000, *P. Affonso 472* (UNISA); Trilha do Banquinho, fl., 21-XII-2000, *P. Affonso 481* (UNISA); Trilha do Campo, fl., 10-IV-2001, *F.T. Farah et al. 2007* (ESA); fl., 11-IV-2001, *F.T. Farah et al. 2123* (UEC); fl., *G.O. Romão et al. 587* (ESA); Trilha do Rio Branco, fl., 12-IV-2001, *G.O. Romão et al. 606* (ESA); *L.D. Meireles et al. 111, 117* (ESA); Floresta ribeirinha ao longo do Rio Mambu, fl., 13-IV-2001, *L.D. Meireles et al. 143* (ESA); Sub-bosque de *Pinus*, fl., 14-IV-2001, *F.M. Souza 142* (ESA, UEC); Trilho do Mirante, fl., 27-III-2002, *P. Affonso 567* (UNISA); Trilha do Banquinho, fl., 27-III-2002, *P. Affonso 576* (UNISA); Trilha do Banquinho, fl., 29-XI-2002, *V.M. Higashi & C.V. Silva 7* (UNISA); Trilha da Bica, fl., 16-IV-2007, *P. Affonso 979* (UNISA); Trilha da Bica, fl., 31-III-2009, *P. Affonso 1118* (UNISA).

The species is typically found at altitudes above 750 m in the Atlantic Forest domain in the States of Rio de Janeiro and São Paulo (Coelho *et al.* 2009, 2024). It is considered Vulnerable (Coelho *et al.* 2009).

According to Coelho *et al.* (2009), it blooms from February to April and July to December, with fruiting occurring in March. In the study area, it was observed in bloom practically every month of the year.

Among the species present in São Paulo State, *Anthurium longicuspidatum* shares similarities with *A. parasiticum* and *A. intermedium*. While *A. longicuspidatum* features a cylindrical and slightly sulcate petiole with a leaf base ranging from obtuse to acute, *A. parasiticum* exhibits a subobtuse to slightly

sulcate petiole and generally a truncate to obtuse leaf base. Additionally, *A. intermedium* possesses a flattened to sulcate petiole and a leaf blade that is generally acute to cuneate at the base. It may also be mistaken for *A. organense* Engl., which also occurs in São Paulo State, but can be distinguished by its typically impressed and prominent secondary veins on both surfaces of the blade, pink to reddish-violet inflorescences, and a spadix that is usually sessile or has a stipe up to 0.3 cm long. In contrast, *A. organense* exhibits obscure to faintly visible secondary veins on the blade surfaces, green to greenish-violet to violet inflorescences, and a spadix with a stipe up to 1.6 cm long (Coelho *et al.* 2009).

The species is distinguished from others occurring in the study area by its pinkish cataphylls and prophylls, erect leaves, and reddish spadix and spathe. It also has the most restricted geographical distribution among the species studied in this work.

Anthurium marense K.Krause, Notizbl. Bot. Gart. Berlin-Dahlem 9: 271. 1925

Terrestrial; stem erect; cataphylls and prophylls persistent, entire in the apex to sligthly decomposing in the base, internodes 0.25-0.75 cm long. Petiole 4-15 cm long, flattened; geniculum 0.5-1 cm long; blade 7-17 × 3-8 cm, chartaceous, elliptical, lanceolate to rare obovate, with glandular punctations in both surfaces, base obtuse to acute, apex acute to obtuse-apiculate; mibrid prominent in both surfaces; secondary veins prominent abaxially, slightly impressed adaxially; collective veins 0.3-0.8 cm, away from the margin. Peduncle 11.7-30 cm long, angular, vinaceous; spathe 1.2-5 × 0.2-0.7 cm, persistent, sligthly naviculate, vinaceous; spadix 2-8 cm long, cylindrical, vinaceous; stipe 1.1-3.5 cm long. Fruit not observed.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Sub-bosque de *Pinus*, fl., 14-IV-2001, *E. Furlan 141, 143* (ESA); Trilha da Captação de Água, fl., 30-IV-1999, *P. Affonso 408* (UB/PMSP); Trilha do Campo, fl., 11-IV-2001, *E. Furlan 2123* (ESA).

Species exclusively found in the Atlantic Forest domain of Brazil, growing in shaded and humid areas in hillside forests, at altitudes between 800-1350 m, occurring in the States of Minas Gerais, Rio de Janeiro, São Paulo, and Paraná (Coelho *et al.* 2009, 2012, 2024). It is classified as Least Concern in most of the States where it occurs, but is listed as Vulnerable in Paraná State (Rocha *et al.* 2014).

According to Coelho *et al.* (2009) and Coelho (2012), it flowers all year round and fruits in February, March, and June. In the Núcleo Curucutu, it blooms in April.

The specimens from Núcleo Curucutu exhibit some differences compared to those analyzed by Coelho (2012), including slightly longer petioles, reaching up to 15 cm long (vs. 13.1 cm); a midrib that is prominent on both surfaces (vs. midrib not observed); peduncles extending up to 30 cm long (vs. 27.8 cm); and larger spadices measuring 2-8 cm long (vs. 1.15-5.8 cm).

Anthurium marense can be distinguished from other species in the study area by the presence of glandular punctations on both surfaces of the leaf blade. It may be confused with *A. hoehnei* K.Krause, a species endemic to São Paulo State, which can be distinguished by typically having an ovate-lanceolate blade, a truncate to cordate base, and a longer stipe, up to 6.6 cm long (Coelho *et al.* 2009).

Anthurium pentaphyllum (Aubl.) G.Don, Hort. Brit. (ed. 3): 633. 1839.
Figures 2 c, 4 d-e

Epiphyte; stem scandent; cataphylls and prophylls entire to decomposing into fibers, grayish; internodes 1-4.3 cm long. Petiole 42.2-45 cm long, cylindrical; geniculum 0.8-1 cm long; blade palmate, leaflets 6-13, 8-30 × 3-8.9 cm, petiolules subsessile to 3 cm long, membranous to chartaceous, obovate to lanceolate, absent of glandular punctations, base acute to acuminate, apex acuminate; midrib prominent on both surfaces; secondary veins visible abaxially, inconspicuous adaxially; collective veins 0.4-1.3 cm, away from the margin. Peduncle 4.2 cm long, cylindrical, green; spathe 9 × 2 cm, persistent, lanceolate, vinaceous-green; spadix 5-10.8 cm long, green, sessile. Fruit greenish to vinaceous.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Trilha da Captação de Água, 4-VI-1998, fl., *R.J.F. Garcia 1520* (UNISA); 11-VII-2002, fl., *P. Affonso 592* (UNISA); 17-I-2008, fl., fr., *P. Affonso 1037* (UNISA).

Additional examined material: Brazil. Minas Gerais: Carangola, Fazenda de Santa Rita, 31-III-1987, veg., *L. Krieger CESJ21739* (SPF). Rio de Janeiro: Paty do Alferes, fl., 1-XI-1970, *U. Confucio 9588* (SPF). São Paulo: Pariquera-Açú, Estação Experimental do Inst. Agronômico, fl., 21-VI-1995, *N.M. Ivanauskas 236* (ESA, SPF); Peruíbe, Estação Ecológica Juréia-

Itatins, Trilha do Imperador, fr., 6-I-2000, *R.J.F. Garcia 1869* (PMSP, SP); São Paulo, Horto do Museu Paulista, fl.,7-VII-1932, *W. Hoehne s.n.* (SPF 10312); Sete Barras, Parque Intervales, Trilha Amarela, fr., 13-V-1996, *E.M. Vieira 1504* (HRCB, SPF).

Species native to the Amazon Forest, Atlantic Forest, and Pantanal domains, in the States of Acre, Amazonas, Bahia, Espírito Santo, Mato Grosso, Minas Gerais, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Santa Catarina, and São Paulo (Coelho *et al.* 2024). It is classified as Least Concern (Rocha *et al.* 2014).

According to Rocha *et al.* (2014), it blooms and bears fruit throughout the year. Coelho (2012) indicated that it flowers in January, April, from May to July, and from September to December. In the Ilha do Cardoso, flowering was observed in June and August, and fruiting in June, August, October, and November (Coelho 2015). In the Núcleo Curucutu, it was collected with flowers in January, June, and July, and with fruits in January.

Of the species found in São Paulo State, *Anthurium pentaphyllum* closely resembles *A. sinuatum* Benth. ex Schott in terms of leaflet margin and peduncle size. However, *A. pentaphyllum* features an entire foliole margin and a peduncle measuring up to 20 cm long. In contrast, *A. sinuatum* exhibits a sinuate foliole margin and a peduncle measuring between 20.3 and 36.6 cm long (Coelho *et al.* 2012).

Anthurium pentaphyllum can be distinguished from other species in the study area by the presence of palmate leaves.

Anthurium sellowianum Kunth, Enum. Pl. 3: 70. 1841. Figures 2 d, 4 f-j

Epiphyte or terrestrial; stem erect; cataphylls and prophylls entire to decomposing into fibers, green to reddish; internodes 0.3-0.7 cm long. Petiole 8-19 cm long, flattened, carinate adaxially; geniculum 0.6-1 cm long; blade 40.5-57.5 × 6.9-13.5 cm, chartaceous, lanceolate, absent of glandular punctations, base acute to rarely obtuse, apex acuminate; midrib prominent on both surfaces; secondary veins prominent abaxially, slightly impressed adaxially; collective veins 0.5-1 cm, away from the margin. Peduncle 24.5-45 cm long, angular, green; spathe 4.7-14.5 × 0.5-1.3 cm, persistent, lanceolate, green to reddish-vinaceous; spadix 6.5-22.4 cm long, vinaceous to brownish, sessile. Fruit green to yellowish.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Trilha da Estrada da Entrada, 30-IV-1999, fl., *L.C.Q.M.P. Sampaio 198* (UNISA); Trilha da Captação de Água, 30-IV-1999, fl., *P. Affonso 412* (UNISA); Trilha da Mata, 26-VI-2001, fl., *M.A.S. Mayworm 217* (UNISA); Trilha do Banquinho, 8-VI-1998, fr., *P. Affonso 289* (UNISA); 22-VI-2001, fl., *P. Affonso 519* (UNISA); 27-III-2002, fl., *P. Affonso 575* (UNISA); Trilha do Mirante, 14-V-1997, fl., *N.S. Chukr 541* (UNISA).

Additional examined material: Brazil. Paraná: Guaratuba, fl., 14-XII-1971, *L. Krieger 11134* (CESJ, SPF, UB). São Paulo: Mogi das Cruzes, Parque Municipal da Serra do Itapety, fr., 8-IX-1991, *Prando 17* (SP); Pariquera-Açú, Estação Experimental do Inst. Agronômico, fl., 13-IX-1995, *N.M. Ivanauskas 358* (ESA, SPF); Santo André, Campo Grande, próximo a Reserva de Piracicaba, fl., 29-I-1996, *E. Mariano Neto et al. 22* (PMSP, SP).

Anthurium sellowianum is endemic to Brazil and occurs in the Atlantic Forest domain of the States of Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, and São Paulo (Coelho *et al.* 2024). The species is classified as Least Concern (Rocha *et al.* 2014).

In São Paulo State, Coelho (2012) reported that the species was collected with flowers in January, from March to July, and from September to December; with fruits in January, March, April, and from July to December. In the Ilha do Cardoso, it was recorded in bloom in January, July, August, September, and October (Coelho 2015). In the Paraná State, it flowers and produces fruit year-round (Rocha *et al*. 2014). In the study area, it was collected with flowers during various months of the year, with fruits in June, being in a vegetative state only in January, February, July, and August.

In the Ilha do Cardoso, the species was described as generally epiphytic, with occasional occurrences as rupicolous or terrestrial (Coelho 2015). In Núcleo Curucutu, it was described as ranging from epiphytic to terrestrial.

According to Coelho (2012) and Rocha *et al.* (2014), the species presents a sessile or stipitate spadix measuring 0.2-0.6 cm long. In all materials from the Núcleo Curucutu, the spadices are sessile.

The specimens from Curucutu exhibit certain morphological differences compared to those previously studied in the São Paulo State (Coelho 2012), including shorter internodes, measuring 0.3-0.7 cm long (vs. 0.7-1.5 cm), and a spathe that is exclusively sessile (vs. sessile or with a stipe 0.2-0.4 cm long).

Anthurium sellowianum is the only species of Araceae occurring in Núcleo Curucutu with a petiole

that is flattened and carinate in the adaxial surface. Of the species native to São Paulo State, it bears a resemblance to *A. miquelianum* C.Koch & Augustin. However, *A. sellowianum* has a flattened petiole with adaxially carinate margins, while *A. miquelianum* features a subcylindrical petiole with obtuse adaxial margins (Coelho *et al.* 2012).

Monstera adansonii Schott, Wiener Z. Kunst 4: 1028. 1830.
Figure 5 a-b

Hemi-epiphyte; stem sympodial; internodes 3-5 cm long. Petiole 19-25 × 0.8-2 cm, canaliculate; geniculum 2-2.5 cm long; blade 30-40 × 10-14 cm, simple, chartaceous, elliptical-oval, fenestrate, base cuneate, apex acute, concolor to slightly discolored, green adaxially, yellow-greenish abaxially; midrib prominent; secondary veins conspicuous. Peduncle 20-25 cm long; inflorescence 1 per leaf axil; spathe 14-20 × 6-9 cm, oblong-ovate, pale yellow to slightly greenish; spadix 14-16 × 2-3 cm, white-greenish, sessile. Infructescence 10-17.5 × 1.6-2.3 cm, white. Fruit berry 0.7-1 × 0.5-0.6 cm, subglobose, cream. Seed 1, 0.7-0.8 × 0.6-0.85 cm, ovoid.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Floresta Ombrófila Densa Baixomontana e Montana no entorno do Vale dos Rios Mambu e dos Macacos, fl., 17-IV-2001, *L.D. Meireles et al. 200* (ESA).

Additional examined material: Brazil. São Paulo: Eldorado, Cachoeira do Sapatu, 5-IX-1995, fr., *V.C. Souza et al. 9159* (SP); Ubatuba, Estrada da casa da farinha, fl., 30-I-1996, *H.F. Leitão Filho et al. 34261* (SP).

Monstera adansonii is distributed in Costa Rica, French Guiana, Guyana, Nicaragua, Suriname, Trinidad and Tobago, and Venezuela (Cedeño-Fonseca *et al.* 2022).

In Brazil, it is found in the Amazon Forest, Caatinga, Cerrado, and Atlantic Forest domains, extending across the States of Acre, Alagoas, Amazonas, Amapá, Bahia, Ceará, Espírito Santo, Mato Grosso, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Roraima, Sergipe, Santa Catarina, and São Paulo. The species also shows a territorial gap, a set of Brazilian states where it is absent, between the Distrito Federal and five surrounding States in the Midwest (Mato Grosso do Sul, Goiás), North (Tocantins), and Northeast (Piauí, Maranhão) (Mayo & Andrade 2024).

Temponi *et al*. (2006) observed the species in both forest interiors and open areas. In the Núcleo Curucutu, it was found in forest interiors, humid environments and at low elevations.

According to Pereira & Temponi (2017), the species is found with flowers between October and February and with fruits between March and July. In the Ilha do Cardoso, it was recorded with flowers in January and from March to July, and with fruits from April to June, as well as in September, October, and December (Coelho 2015). In the Núcleo Curucutu, it was found only once, and the individual was in bloom in April.

Regarding the specimens examined by Coelho (2012), those from Núcleo Curucutu exhibit thinner leaf blades, not exceeding 14 cm wide (vs. 14-46 cm), and slightly smaller and slender infructescences, measuring 10-17.5 x 1.6-2.3 cm (vs. 15-20 x 2-2.9 cm).

Monstera adansonii is distinguished from others Araceae in the Núcleo Curucutu by its fenestrate leaves. Among the species of *Monstera* present in São Paulo State, it may be confused with *M. praetermissa* E.G.Gonç. & Temponi. However, *M. adansonii* is characterized by its persistent sheath and fenestrations that do not reach the leaf margin and by the color of its fruit, which is white. In contrast, *M. praetermissa* features a deciduous sheath, fenestrations that extend close to or reach the leaf margin, and an orange fruit (Coelho *et al.* 2012).

Philodendron Schott

Hemi-epiphyte; stem scandent to creeping; internodes generally long, occasionally very short, with adventitious roots at the nodes. Leaves petiolate, simple, alternate, blade membranous to chartaceous; venation pinnate-parallel. Inflorescence terminal in floral sympodium; peduncle usually shorter than the petiole; spathe persistent; spadix sessile to stipitate: pistillate zone basal, staminate zone apical, separated from it by a median staminodial zone, may or may not present an apical staminodial zone. Unisexual flowers without perigon; staminate flowers with free stamens, anthers sessile to subsessile; pistillate flowers with ovoid gynoecium, ovary 4-9-locular, ovules per locule 1-many. Fruit berry; seeds 1-many.

Philodendron is a neotropical genus comprising 482 species primarily distributed in the Andes, Amazon Forest, and Central America. In Brazil, 153 species are identified, with 71 of them being endemic. In São Paulo State, 16 species occur, with *Philodendron simonianum* Sakur. reported as endemic (Boyce & Croat 2018, Sakuragui *et al.* 2024).

Figure 5. a-b. *Monstera adansonii* Schott. a. Habit. b. Inflorescences. c. *Philodendron appendiculatum* Nadruz & Mayo. c. Habit. d-f. *P. propinquum* Schott. d. Habit. e. Inflorescence. f. Detail of the inflorescence. g-j. *P. roseopetiolatum* Nadruz & Mayo. g. Habit. h. Detail of the reddish-vinaceous apex of the pedicel. i. Inflorescence. j. Inflorescence seen from above. Photos: Simone Soares: a, c; Nicolás Lavandero: b; Ulisses Gonçalves: d, g-h; Paulo Affonso: e-f, i-j.

Philodendron appendiculatum Nadruz & Mayo, Bol. Bot. Univ. São Paulo 17: 50. 1998.
Figure 4 c

Stem scandent, cylindrical; internodes 4.5-5 cm long. Sheath 3-4.5 cm long, closed; ligule absent; petiole 18-26 cm long, cylindrical to slightly flattened, entirely green; blade 18-28.5 × 14-17 cm, chartaceous, ovate, base cordate to sagittate, apex acute to slightly acuminate. Inflorescence 1-3 per floral sympodium; peduncle 3-4 cm long, entirely green; spathe 12-15 × 2.5-3.4 cm, pronounced constriction in the midsection, greenish to cream externally, internally cream; spadix 7.2-8 cm long, cream-whitish. Ovary 6-8-locular, ovules 4-5 per locule. Fruit not observed.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu; Trilha do Rio Embu Guaçu, fr., 26-II-1999, *C.M. Izumisawa et al. 179* (PMSP, UNB).

Additional examined material: Brazil. São Paulo: Pariquera-Açu, Propriedade de Antônio Povinski, fl., 12-XI-1995, *N.M. Ivanauskas 557* (ESA, HUEM); São Bernardo do Campo, Parque Caminhos do Mar, fl., 24-X-1994, *J.V. Godoi & S. Machado 645* (SP).

Philodendron appendiculatum is an endemic species of Brazil, occurring exclusively in the Atlantic Forest domain of the States of Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo (Sakuragui *et al.* 2005, Coelho 2012, Sakuragui *et al.* 2024). The species is classified as Least Concern (Buturi *et al.* 2016).

Coelho (2000) indicated that the species occurs in moist and shaded environments, which are the same characteristics observed along the Embu Guaçu River Trail (Trilha do Rio Embu Guaçu), the only site within the Núcleo Curucutu where the species has been recorded.

According to Coelho (2012), in the São Paulo State, the species was collected with flowers and fruits from October to March. Specifically, in the Parque Estadual Fontes do Ipiranga, flowering was observed in December and February (Coelho 2000). In the Ilha do Cardoso, flowering was noted in November and fruiting in May (Coelho 2015). In the Núcleo Curucutu, it was collected with fruits in February.

Unlike Coelho (2012), this study provides data on the sheath of this species. Additionally, specimens from Curucutu exhibit 1-3 inflorescences per floral sympodium (vs. 2-3) and slightly smaller spadices, measuring 7.2-8 cm long (vs. 7.5-12.5 cm).

Philodendron appendiculatum can be distinguished from other species in the study area by its entirely white spathe, which features a pronounced constriction and a clear differentiation between the tube and the blade. It resembles *P. roseopetiolatum*; however, *P. appendiculatum* shows a pronounced constriction in the midsection of the spathe, a trait that is subtle in *P. roseopetiolatum* (see comparative comment in *P. roseopetiolatum*). There might also be morphological confusion with *Philodendron inops* Schott; which also occurs in the São Paulo State; however, this species exhibits faintly impressed or absent lateral veins, whereas *P. appendiculatum* displays distinct lateral veins (Coelho 2012).

Philodendron glaziovii Hook.f., Bot. Mag. 111: t. 6813. 1885.
Figure 3 a-e

Stem creeping or scandent, cylindrical; internodes 3-4 cm long. Sheath 2.5-3 cm long, closed; ligule absent; petiole 10-20 cm long, cylindrical, entirely green; blade 28.2-33 × 4-7.5 cm, chartaceous, lanceolate, base cuneate, apex acuminate to acute. Inflorescence 1 per floral sympodium; peduncle 5-6 cm long, entirely green; spathe 15.2-15.5 × 3-4.2 cm, moderate constriction in the midsection, white-greenish externally, green-yellowish and vinaceous internally; spadix 12.5-13 cm long, white. Ovary 8-locular, ovules many per locule. Fruit not observed.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu, Trilha da Estrada da Entrada, fl., 29-X-1998, *R.J.F. Garcia & M. Alfonso 1655* (PMSP, UB); Trilha Nova da Bica, fl., 21-X-2003, *V.M. Higashi 11* (UNISA).

Additional examined material: Brazil. São Paulo: São Paulo, Mata do Jardim Botânico, fl., XI-1950, *O. Handro 199* (MO, SPF).

Species occurring only in the Atlantic Forest domain of the States of Espírito Santo, Rio de Janeiro, and São Paulo (Sakuragui *et al.* 2024). Within the Núcleo Curucutu it was collected within the forest in a humid location.

In the States of Rio de Janeiro and São Paulo, the species was collected with flowers between October and December and with fruits in January (Sakuragui *et al.* 2011, Coelho 2012). According to Coelho (2015), flowering also occurs in May and November. In the study area, it was recorded in bloom only in October, fruiting was not observed.

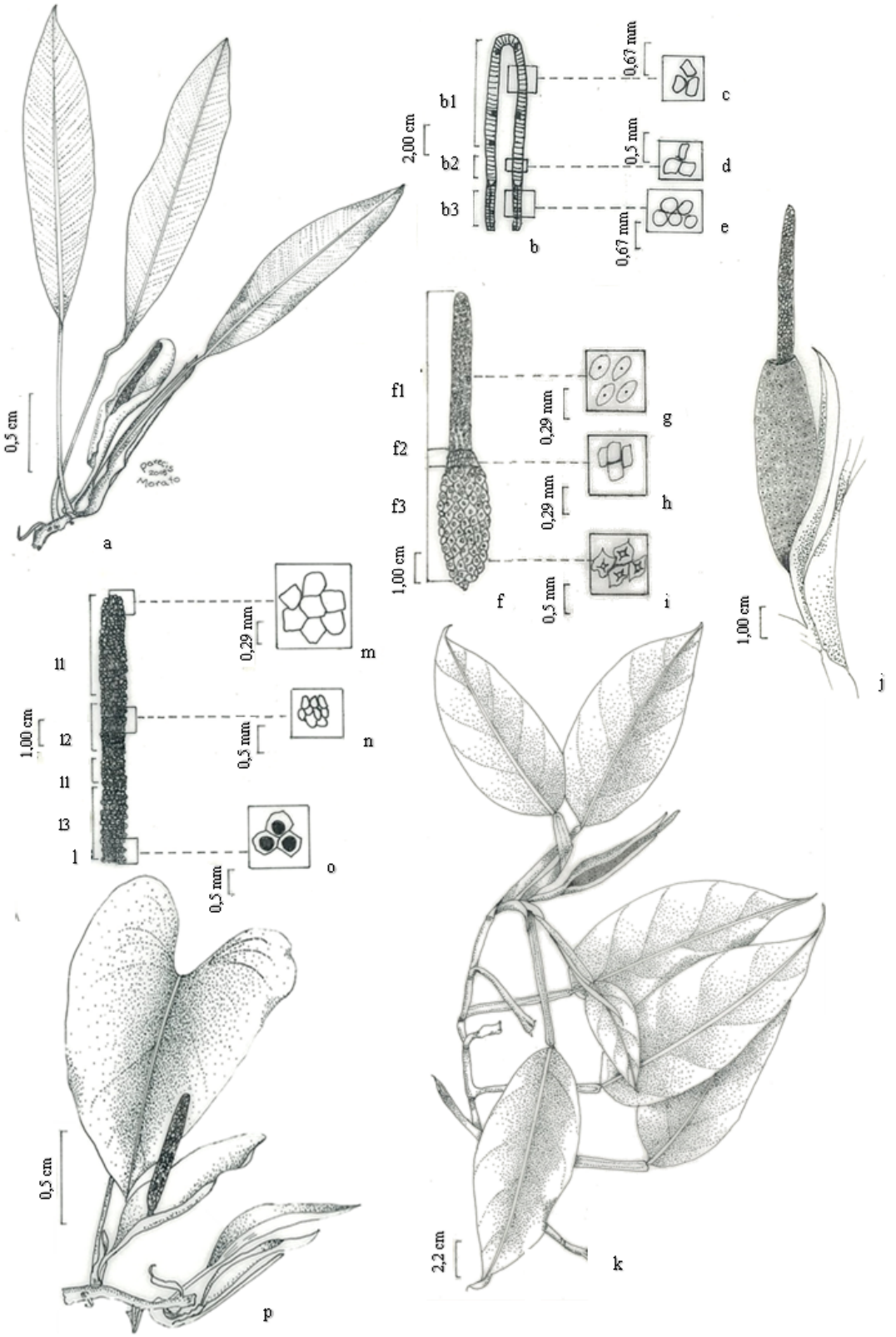

Figure 3. a-e: *Philodendron glaziovii* Hook.f.. a. Habit. b. Spadix. b1/c. Staminate flowers/frontal view. b2/d. Sterile flowers/frontal view. b3/e. f-k: *Philodendron propinquum* Schott. f-j. Inflorescence, f1. Zone of staminate flowers. f2. Zone of sterile flowers. f3. Zone of pistillate flowers. g. Staminate flowers. h. Sterile flowers. i. Fruit in frontal view. j. inflorescence. k. Habit. l-p: *Philodendron roseopetiolatum* Nadruz & Mayo. l. Spadix. l1/m. Sterile flowers/frontal view. l2/n. Staminate flowers/frontal view. l3/o. Pistillate flowers/frontal view. p. Habit.

When compared with specimens from other areas of São Paulo State (Coelho 2012), those from Núcleo Curucutu exhibit shorter petioles, measuring 10-20 cm long (vs. 22.1-31.3 cm), and smaller spadices, ranging from 12.5-13 cm long (vs. 13-16 cm).

Philodendron glaziovii is distinguished from others in the study area by having a sheath smaller than half the petiole. Of the species of *Philodendron* native to São Paulo State, it shares similarities with *P. loefgrenii* Engl.; which also occurs in the São Paulo State; but they differ in terms of leaf and spathe morphology. While *P. glaziovii* features a lanceolate leaf and an oblong spathe, *P. loefgrenii* exhibits an oblong, ovate to elliptical leaf, and an ovate to cymbiform spathe (Coelho *et al.* 2012).

Philodendron propinquum Schott, Syn. Aroid.: 78. 1856.
Figures 3 f-k, 5 d-f

Stem creeping or scandent, cylindrical, rare flattened; internodes 1-9.5 cm long. Sheath 13-15 × 0.4-1.3 cm, open and expanded; ligule 0.3-0.5 cm long, may or may not exceed the insertion of the petiole with the leaf; petiole 5.3-14 cm long, cylindrical, entirely green; blade 7.3-21.2 × 3.2-8.7 cm, membranous to chartaceous, oblong-lanceolate, base obtuse to rounded, apex acuminate to acute. Inflorescence 1 per floral sympodium; peduncle 1.2-3 cm long, entirely green; spathe 6.2-8.5 × 2.5-4 cm, subtle constriction in the midsection, white to greenish-cream externally, internally cream; spadix 4-7.4 cm long, cream-whitish. Ovary 4-locular, ovules many per locule. Immature fruit green.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu; Trilha da Bica, fl., 16-XII-2004, *P. Affonso 777* (UNISA); Trilha da Captação de Água, fl., 30-IV-1999, *P. Affonso 413* (UNISA); fl., 22-VI-2001, *P. Affonso 517* (UNISA); Trilha do Banquinho, fl., 13-XII-1997, *R.J.F. Garcia 1420* (UNISA); fr., 25-II-1999, *C.M. Izumizawa 158* (UB, UNISA); fl., 21-XII-2000, *P. Affonso 480* (UNISA); fl., 27-III-2002, *P. Affonso 578* (UNISA); fl., 27-III-2002, *P. Affonso 579* (UNISA); Trilha do Mirante, fl., 18-I-1996, *G.M.P. Ferreira et al. 31* (PMSP, RB, UEC).

Additional examined material: Brazil. São Paulo: Caieiras, Fazenda da Companhia Melhoramentos, 16-VIII-1994, fr., *A.M. Giulietti et al. 1152* (PMSP, RB, SP); Itararé, Fazenda Ibití, 8-II-2000, fr., *F. Barros 3042* (SP); Pariquera-Açú, Estação Experimental do Inst. Agronômico, fl., 21-XI-1995, *N.M. Ivanauskas 569* (ESA, SPF); Pindamonhangaba, Fazenda São Sebastião do Ribeirão Grande, fl., 29-XI-1993, *S.A. Nicolau et al. 646* (SP); São Paulo, Parque Estadual das Fontes do Ipiranga, fl., 21-XI-1979, *M. Kirizawa & G.M. Barroso 518* (SP).

This species is distributed in the Atlantic Forest domain of the States of Bahia, Espírito Santo, Minas Gerais, Paraná, Pernambuco, Rio de Janeiro, Santa Catarina, and São Paulo (Sakuragui *et al.* 2024). The specimens collected in the study area were located in a humid and shaded forest. The species is classified as Least Concern (Barbosa & Sakuragui 2015, Buturi *et al.* 2016).

The specimens examined by Temponi *et al.* (2006) were found exclusively within the forest interior, whereas most of the specimens from Núcleo Curucutu were collected at the forest edge.

According to Coelho (2012), in the São Paulo State, the species was collected with flowers from September to January and in April, with fruits observed from April to December. In the Parque Estadual Fontes do Ipiranga, it was collected with flowers in November and December (Coelho 2000), while on Ilha do Cardoso, flowering specimens were collected in July and December (Coelho 2015). In the study area, specimens were collected with flowers in January, March, April, June, and December, and immature fruits in February. According to the label of the specimen *G.M.P. Ferreira et al. 31*, the inflorescences of the species exhibit an unpleasant odor.

The specimens from Núcleo Curucutu show minimal differences compared to those described by Coelho (2012), with notable distinctions in leaf blades reaching up to 8.7 cm long (vs. 7.9 cm) and the detailed description of the ligule.

Philodendron propinquum differs from other species in Núcleo Curucutu by being the only one to exhibit a ligule. Of the species occurring in the São Paulo State, *P. propinquum* shares similarities with *P. oblongum* (Vell.) Kunth. However, *P. propinquum* exhibits an open and expanded sheath, whereas *P. oblongum* features a closed and erect sheath (Coelho *et al.* 2012). It also resembles *P. obliquifolium*, from which it can be distinguished by having up to 10 primary lateral veins, whereas *P. obliquifolium* has more than 10 primary lateral veins (Buturi *et al.* 2016).

Philodendron roseopetiolatum Nadruz & Mayo, Bol. Bot. Univ. São Paulo 17: 55. 1998.
Figures 3 l-p, 5 g-j

Stem scandent, cylindrical; internodes 3-10 cm long. Sheath 1.7-6 cm long, closed; petiole 17-27 cm

long, flattened adaxially, rounded abaxially, green, apex reddish-vinaceous; ligule absent; blade 23-27 × 13-16 cm, chartaceous, sagittate, base cordate, apex acute to obtuse. Inflorescence 2-3 per floral sympodium; peduncle 2-4 cm long, green, apex reddish-vinaceous; spathe 12-17 cm long, subtle constriction in the midsection, white externally, with a vinaceous basal spot internally; spadix 10-15 cm long, white-yellowish. Ovary 7-9-locular, ovules 3-4 per locule. Fruit beige.

Examined material: Brazil. São Paulo: São Paulo, Parque Estadual Serra do Mar, Núcleo Curucutu; Floresta ribeirinha ao longo do Rio Mambu, fl., 13-IV-2001, *F.M. Souza et al. 105* (ESA); Trilha da Matinha, fr., 10-XII-2002, *R.A. Alves & R.J.F. Garcia 35* (PMSP); Trilha do Banquinho, fl., 29-XI-2002, *V.M. Higashi 06*, (UNISA, RB); fl., 24-XI-2004, *P. Affonso 746* (UNISA); Trilha do Campo, fl., 18-XII-1996, *R.J.F. Garcia 947* (SP, UNISA); Trilha do Mirante, fl., 13-XII-1997, *R.J.F. Garcia 1445* (UNISA); fl., 27-III-2002, *P. Affonso 573* (UNISA); Trilha do Rio Embu Guaçu, fl., 08-VII-1997, *P. Affonso 29* (UNISA); 15-XI-1997, *J.V. Coffani-Nunes 179* (PMSP); fr., 6-III-1998, *P. Affonso 159* (UNISA); fr., 26-II-1999, *C.M. Izumizawa 179* (UNISA).

Additional examined material: Brazil. Rio de Janeiro: Santa Maria Madalena, Parque Estadual do Desengano, Pedra do Desengano, fl., 24-III-2002, *C.G. Gomes 145* (SPF). São Paulo: Salesópolis, fl., XII-1958, *O. Handro 847* (SP).

Species found in the Atlantic Forest domain of the States of Paraná, Rio de Janeiro, Santa Catarina, and São Paulo (Buturi *et al.* 2016, Sakuragui *et al.* 2024). In the study area, the species occurs in closed habitats and was frequently located near watercourses.

The species is classified as Least Concern across its global distribution; however, in Paraná State, it is classified as Critically Endangered (Sakuragui *et al.* 2011, Buturi *et al.* 2016).

Sakuragui *et al.* (2005) recorded the species with young inflorescences in June, maturing between September and February, and fruits in March. In Núcleo Curucutu, it was collected with flowers in February, March, April, July, November, and December, and fruits in December, February, and March.

Of the taxa found in São Paulo State, this species is quite similar to *Philodendron appendiculatum*. However, in *P. roseopetiolatum,* during the onset of flowering, the apical leaves display a pink petiole, unlike the green petiole observed in *P. appendiculatum.* Additionally, the base of the spathe exhibits a carmine hue on its inner side, a characteristic not observed in *P. appendiculatum* (see comparative comment in *P. appendiculatum*). It also resembles *P. meridionale* Buturi & Sakur. morphologically, a species endemic to the States of Paraná and Santa Catarina, from which it can be distinguished by its larger leaves and strongly impressed primary lateral veins in *P. roseopetiolatum;* whereas *P. meridionale* has smaller leaves and weakly impressed primary lateral veins (Buturi *et al.* 2016).

In contrast to the specimens described by Coelho (2012), *Philodendron roseopetiolatum* from Curucutu exhibits longer internodes, reaching up to 10 cm long (vs. 2.5-5 cm), shorter petioles measuring 17-27 cm long (vs. 30-50 cm), a peduncle 2-4 cm long (vs. 3.5-5 cm), and a slightly smaller spathe, ranging from 12-17 cm long (vs. 15-18 cm), in addition to the description of the sheath. It is the only species in Núcleo Curucutu characterized by sagittate leaves with a vinaceous-colored petiole apex, while the inner base of the spathe also displays this coloration.

Acknowledgements

We express our gratitude to the Núcleo Curucutu of Parque Estadual Serra do Mar staff, for their invaluable support in specimen collection. Special thanks to Instituto Florestal, for granting authorization for this research. We also extend our appreciation to the Curators of the visited Herbaria: João Batista Baitello *in memoriam* (SPSF), José Rubens Pirani (SPF), Maria Candida Henrique Mamede (SP), and Ricardo José Francischetti Garcia (PMSP). Our appreciation is also extended to Parecis Morato, for the botanical illustrations; to Luiza Oliveira Brigato, for the distribution map and to Universidade Santo Amaro, for their support.

Conflict of interests

There is no conflict of interest.

Author contributions

Vanda Marie Higashi: Contribution to data collection; Contribution in identifications of the studied species; Contribution to data analysis and interpretation.
Leandro Matheus de Carvalho Vaz: Contribution in the concept and design of the study; Contribution to data analysis and interpretation; Contribution to manuscript preparation; Contribution to critical revision, adding intellectual content.

Juliana Moreira Bianchi: Contribution in the concept and design of the study; Contribution to data analysis and interpretation; Contribution to manuscript preparation; Contribution to critical revision, adding intellectual content.
Paulo Affonso: Contribution in the concept and design of the study; Contribution to data collection; Contribution in identifications of the studied species; Contribution to data analysis and interpretation; Contribution to critical revision, adding intellectual content.

Data availability statement

The dataset is located within the manuscript itself.

Literature cited

Almeida, V.R., Temponi, L.G. & Forzza, R.C. 2005. Araceae da Reserva Biológica da Represa do Grama - Descoberto, Minas Gerais, Brasil. Rodriguésia 56 (88): 127-144.

Araceae *in* Flora e Funga do Brasil. 2025. Jardim Botânico do Rio de Janeiro. Available at https://floradobrasil.jbrj.gov.br/FB51 (access in 02-I-2024).

Baltar, S.L.S.M.A., Franco, E.S., Amorim, L.P., Pedrosa, H.C.S., Paixão, T.N., Pereira, R.C.A. & Maia, M.B.S. 2017. Aspectos botânicos e clínicos das intoxicações por plantas das Famílias Araceae, Euphorbiaceae e Solanaceae no Estado de Pernambuco. Revista Fitos 11(2): 119-249.

Barbosa, J.F. & Sakuragui, C.M. 2015. Taxonomy and conservation of the Brazilian extra-Amazonian species of *Philodendron* subg. *Pteromischum* (Araceae). Phytotaxa 191: 45-46.

Bellato, S.M. & Mendes, I.A. 2002. Análise da suscetibilidade ambiental no Núcleo Curucutu do Parque Estadual da Serra do Mar (SP-Brasil). *In*: L.H.O. Gerardi & IA. Mendes (org.). Do natural, do Social e de suas interações: visões geográficas. UNESP, Rio Claro: 93-105.

Beentje, H. 2010. The Kew Plant Glossary: an illustrated dictionary of plants terms. Royal Botanic Gardens, Kew, Richmond.

Boyce, P.C. & Croat, T.B. 2018. The Überlist of Araceae Totals for Published and Estimated Number of Species in Aroid Genera. Available at http://www.aroid.org/genera/130307uberlist.pdf (access in 20-XII-2023).

Buturi, C.V., Temponi, L.G. & Sakuragui, C.M. 2016. O gênero *Philodendron* (Araceae) no estado do Paraná. Rodriguésia 67(3): 795-814.

Catharino, E.L.M. & Coelho, M.A.N. 2010. Uma espécie nova de *Anthurium* Schott (Araceae), endêmica na Serra da Bocaina, município de Bananal, São Paulo, Brasil. Rodriguésia 61(1): 69-72.

Cedeño-Fonseca, M., Hay, A. & Blanco, M.A. 2022. A taxonomic revision of *Monstera* Adans. (Araceae: Monsteroideae) in Costa Rica. Aroideana 45(1): 4-198.

Coelho, M.A.N. 2000. Flora Fanerogâmica da Reserva do Parque Estadual das Fontes do Ipiranga (São Paulo, Brasil): Araceae. Hoehnea 27(1): 33-39.

Coelho, M.A.N. 2012. Araceae. *In*: Wanderley, M.G.L., Martins, S.E., Romanini, R.P., Melhem, T.S., Shepherd, G.J., Giulietii, A.M., Pirani, J.R., Kirizawa, M., Melo, M.M.R.F., Cordeiro, I., Kinoshita, L.S. (eds.) Flora Fanerogâmica do Estado de São Paulo. São Paulo: Instituto de Botânica v. 7: 27-72.

Coelho, M.A.N. 2015. Araceae. *In*: Melo, M.M.F.R., Barros, F., Chiea, S.A.C., Kirizawa, M., Jung-Mendaçolli, S.L., Wanderley, M.G.L. (eds.). Flora Fanerogâmica da Ilha do Cardoso. v.16. Instituto de Botânica, São Paulo.

Coelho, M.A.N., Temponi, L.G., Camelo, M.C., Mayo, S.J., Pimenta, K.M., Pontes, T.A., Andrade, I.M. & Hammes, J.K. 2024. *Anthurium in* Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. Available at https://floradobrasil.jbrj.gov.br/FB4912 (access in 02-I-2024).

Coelho, M.A.N., Waechter, J.L. & Mayo, S.J. 2009. Revisão taxonômica das espécies de *Anthurium* (Araceae) seção *Urospadix* subseção *Flavescentiviridia*. Rodriguesia 60(4): 799-864.

Dutra Junior, D.L.S., Barros, A.A.M. & Coelho, M.A.N. 2024. *Anthurium* Schott (Araceae) da Serra da Tiririca, Niterói e Maricá, Estado do Rio de Janeiro, Brasil. Hoehnea 51: e1062023.

Engler, A. 1878. Araceae. *In:* Martins, C.F.P. & Eichler, A.G. (eds.) Flora brasiliensis. Monachii, Frid. Fleischer v. 3: 51-101.

Fidalgo, O. & Bononi, V.L.R. 1989. Técnicas de coleta, preservação e herborização de material botânico. Instituto de Botânica de São Paulo, São Paulo.

Garcia, R.J.F. & Pirani, J.R. 2005. Análise florística, ecológica e fitogeográficado Núcleo Curucutu, Parque Estadual da Serra do Mar (São Paulo, SP), com ênfase nos campos junto à crista da Serra do Mar. Hoehnea 32: 1-48.

Gonçalves, E.G. & Lorenzi, H. 2011. Morfologia Vegetal. 2 ed. Plantarum, Nova Odessa.

Guia de Áreas Protegidas. 2023. PE Serra do Mar - Núcleo Curucutu. Sobre o Núcleo. Available at https://guiadeareasprotegidas.sp.gov.br/ap/parque-estadual-serra-do-mar-nucleo-Curucutu/ (access in 20-XII-2023).

Harris, J.G. & Harris, M.W. 1994. Plant identification terminology: an illustrated glossary. Spring Lake Publishing, Utah.

Mayo, S.J. & Andrade, I.M. 2024. *Monstera in* Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. Available at https://floradobrasil.jbrj.gov.br/FB5010 (access in 02-I-2024).

Mayo, S.J., Bogner, J. & Boyce, P.C. 1998. Araceae. *In*: Kubitzki, K. (eds) Flowering Plants. Monocotyledons. The Families and Genera of Vascular Plants. Springer, Berlin, Heidelberg.

Oliveira, M.F., Vaz, L.M.C. & Rocha, M.M. 2022. Plantas Alimentícias Não Convencionais (PANC) no Parque Municipal Shangrilá (São Paulo). Revista Brasileira de Meio Ambiente 10(2): 204-217.

Pereira, S.F. & Temponi, L.G. 2017. Monsteroideae (Araceae) no estado do Paraná, Brasil. Rodriguésia 68(4): 1377-1386.

Pontes, T.A. 2014. Estudo taxonômico das espécies de *Anthurium* seção *Urospadix* (Araceae) endêmicas ao sertão central da Bahia, baseado em dados genéticos e morfométricos, e enfocando em taxonômia. Tese de Doutorado, Universidade Estadual de Feira de Santana, Bahia.

Rocha, L.C.F., Smidt, E.C., Coelho M.A.N. & Temponi, L.G. 2014. O gênero *Anthurium* (Araceae) no estado do Paraná - Brasil. Rodriguésia 65(4): 917-937.

Rosa, D.A. & Affonso, P. 2009. Levantamento do gênero *Oncidium* Sw. Sensu lato (Orchidaceae) no Núcleo Curucutu, Parque Estadual da Serra do Mar, São Paulo. Revista do Instituto Florestal 21(1): 55-62.

Sakuragui, C.M. 1994. Araceae dos campos rupestres da Cadeia do Espinhaço em Minas Gerais, Brasil. Dissertação de Mestrado, Universidade de São Paulo, São Paulo.

Sakuragui, C.M., Calazans, L.S.B., Morais, E.B., Coelho, M.A.N. & Pellegrini, M.O.O. 2011. Diversity and conservation of *Philodendron* Schott (Araceae) in Atlantic Forest of Rio de Janeiro State, Brazil. Journal of Botanical Taxonomy and Geobotany 122: 472-496.

Sakuragui, C.M., Calazans, L.S.B., Soares, M.L., Mayo, S.J. & Ferreira, J.B. 2024. *Philodendron in* Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. Available at https://floradobrasil.jbrj.gov.br/FB5015 (access in 03-I-2024).

Sakuragui, C.M., Mayo, S. & Zappi, D.C. 2005. Taxonomic Revision of Brazilian Species of *Philodendron* Section *Macrobelium*. Kew Bulletin 60(4): 465-513.

Sakuragui, C.M., Mayo, S. & Coelho, M.N. 2007. Flora da Serra do Cipó, Minas Gerais: Araceae. Boletim de Botânica da Universidade de São Paulo 25: 87-94.

Secretaria do Meio Ambiente. 2016. Resolução SMA - 57, de 5-6-2016. Espécies da Flora Ameaçadas de Extinção no Estado de São Paulo. Diário Oficial do Estado de São Paulo, São Paulo.

Takeuchi, C., Affonso, P. & Chuckr, N.S. 2008. Levantamento de Iridaceae Juss. no Núcleo Curucutu, Parque Estadual da Serra do Mar. Revista do Instituto Florestal 20(1): 51-63.

Temponi, L.G. 2006. Sistemática de *Anthurium* sect. *Urospadix* (Araceae). Tese de Doutorado, Instituto de Biociências da Universidade de São Paulo, São Paulo.

Temponi, L.G., Garcia, F.C.P., Sakuragui, C.M. & Carvalho-Okano, R.M. 2005. Diversidade Morfológica e Formas de Vida das Araceae no Parque Estadual do Rio Doce, Minas Gerais. Rodriguésia 56(88): 1-13.

Temponi, L.G., Garcia, F.C.P., Sakuragui, C.M. & Carvalho-Okano, R.M. 2006. Araceae do Parque Estadual do Rio Doce, MG, Brasil. Acta Botanica Brasilica 20(1): 87-103.

Temponi, L.G., Poli, L.P., Sakuragui, C.M. & Coelho, M.A.N. 2012. Araceae do Parque Estadual de Ibitipoca, Minas Gerais, Brasil. Rodriguésia 63(4): 957-969.

Thiers, B. [continuously updated]. Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available at http://sweetgum.nybg.org/ih/ (access in 06-XII-2023).

Vaz, L.M.C. & Affonso, P. 2022. Zingiberales Griseb. in the Núcleo Curucutu, Parque Estadual Serra do Mar, São Paulo State, Brazil. Hoehnea 49: e362021.

Editor Associado: Pedro Henrique Cardoso
Submissão: 27/01/2025
Aceite: 06/10/2025

This preprint was submitted under the following conditions:

- The authors declare that the necessary Terms of Free and Informed Consent of participants or patients in the research were obtained and are described in the manuscript, when applicable.
- The authors declare that the preparation of the manuscript followed the ethical norms of scientific communication.
- The authors declare that they are aware that they are solely responsible for the content of the preprint and that the deposit in SciELO Preprints does not mean any commitment on the part of SciELO, except its preservation and dissemination.
- The authors declare that the data, applications, and other content underlying the manuscript are referenced.
- The deposited manuscript is in PDF format.
- The authors declare that the research that originated the manuscript followed good ethical practices and that the necessary approvals from research ethics committees, when applicable, are described in the manuscript.
- The authors declare that once a manuscript is posted on the SciELO Preprints server, it can only be taken down on request to the SciELO Preprints server Editorial Secretariat, who will post a retraction notice in its place.
- The authors agree that the approved manuscript will be made available under a Creative Commons CC-BY license.
- The submitting author declares that the contributions of all authors and conflict of interest statement are included explicitly and in specific sections of the manuscript.
- The authors declare that the manuscript was not deposited and/or previously made available on another preprint server or published by a journal.
- If the manuscript is being reviewed or being prepared for publishing but not yet published by a journal, the authors declare that they have received authorization from the journal to make this deposit.
- The submitting author declares that all authors of the manuscript agree with the submission to SciELO Preprints.